STATUS OF ATLAS SENSORS

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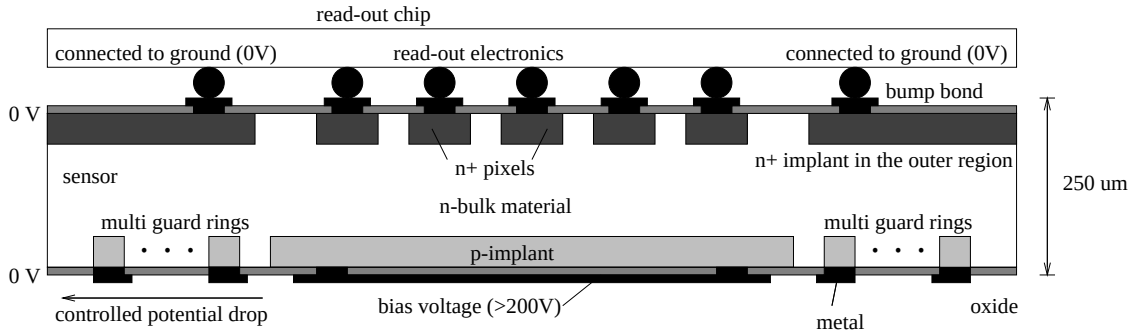
Outline

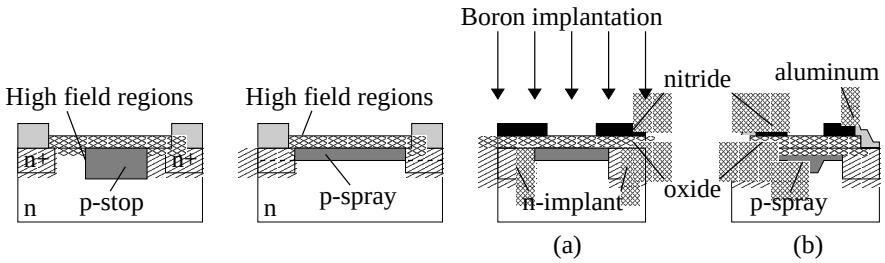
- Design Description
- Recent Tests
- Status

- Design Description
  - Cross Section



    - Each tile contains 328 x 144 pixel cells of size 50 um x 400 um

  - Isolation Techniques



pre-irrad	low E-field	high E-field	low E-field
post-irrad	high E-field	low E-field	low E-field

- Design Description
  - Bias Grid
    - Important for pre-assembly sensor testing
  - Silicon Substrate: Oxygen Enriched
    - Oxygen is diffused into the Si crystal
    - Provides for more radiation tolerant Si because the effective doping concentration of the damaged crystal is lower than with standard Si.
    - RD48 (Rose) Collaboration Results: the depletion voltage of a highly irradiated sensor 10^{14} n/cm^2 is lower by about a factor of two than with standard Si.

- Recent Tests, Test Beam Results
  - Charge Collection Efficiency
    - Non-irradiated, 99.1%
    - Irradiated 10^{15} n/cm^2, 98.3%
  - Depletion Depth (Irradiated to 10^{15} n/cm^2)
    - 105 um at 300V, 190 um at 600V
  - Space Resolution
    - Single Hit: 22 um, 23 um post-irrad
    - Double Hit: 5 um, 6 um post-irad
- Ongoing Test Beam Program
  - Measurement of irradiated sensors
  - Study the charge collection of fully and partially depleted oxygenated sensors

- Status
  - Pixel Design
    - Ready, Radiation Hardness Ensured
    - Production Wafer, Layout Finalized
    - CiS, Seiko, IRST, Tesla produced prototype wafers
  - Design Reviews
    - Final Design Review (FDR) Passed Dec. 1999
    - Production Readiness Review (PRR) Passed Feb. 2000
  - Tender Documents, Approved
  - Tendering Procedure, In-Process
    - Pre-production Summer 2000
    - Production Beginning 2001